

Attila Krasznahorkay: **Using high-level C++ for HEP data processing on accelerators**

Traditional CPUs are being replaced more and more in High Performance Computing as the source of most of the computing power of any cluster, by different types of accelerators. GPGPUs, FPGAs, and even some more specific hardware. Even the CPUs themselves are becoming more complicated, often holding hardware specialised for performing just some types of calculations. Writing code that would make use of these different types of accelerators has been a fairly involved task during the last 10 years. However with the ever wider adoption and availability of these types of hardware, it became necessary to be able to write efficient and portable custom code for them in more convenient ways than what was available before. The industry recognised this, and is making it ever more convenient to use high-level C++ for writing code for these types of devices.

In this talk I will give an overview of the evolution of programming languages for accelerators, showing the latest and greatest techniques. Including how oneAPI and CUDA can be used in their latest versions. I will show how these techniques are being explored in the ATLAS Experiment at the LHC, and what results we got with them so far in processing the data collected by the experiment.